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METHOD AND APPARATUS FOR GENERATING WEBSITE LINKS

RELATED APPLICATION

This application claims the benefit of U.S. Provisional Application No. 60/253,570 filed on November 28, 2000.

5 The entire teachings of the above application are incorporated herein by reference.

BACKGROUND OF THE INVENTION

Contents of a web page may include text and images. So called "hyperlinks" may be embedded in any of the text or image areas of a web page. A hyperlink
10 embedded in a given web page allows someone accessing the given page to access another web page which is the destination of the link. In this way, hyperlinks allow a web user to navigate through a variety of web pages across different web sites or within a common web site and access numerous pieces of information.

A hyperlink has two major parts, namely, a representation and the underlying
15 code. The representation is visible to the end user and is usually in the form of a character string, graphical image, or other visual element of a web page indicating the presence of a hyperlink. When an end user viewing a given web page moves the cursor over a hyperlink, the cursor changes its shape, the hyperlink's visible representation is altered, or some other clue is given to the end user that a cursor click on that part of the
20 web page would activate the hyperlink.

The underlying code of a hyperlink is not visible to the end user. The underlying code is usually in the Hypertext Markup Language (HTML) format and contains the Universal Resource Locator (URL) of the link destination and some additional information. When the end user activates a hyperlink (e.g., as described above), the

5 underlying code is executed by the end user's computer. This causes the computer to access and present to the end user the web page designated by the destination URL and possibly to transmit some additional information on the network.

Hyperlinks may be embedded in a web page for promotional or commercial purposes. For example, to increase web users' awareness of a merchant's web site and

10 offers presented therein, other web sites may serve as referrals to the merchant's web site. The owners of such referring web sites are termed affiliates, associates, or business partners and the like of the referred merchant. Typically, a referring web site has one or more web pages that recite the referred merchant by company name, web site, description of products or services, etc. and ultimately make reference to the pertinent

15 web page of the referred merchant. A hyperlink is coupled to the reference, and upon the end user's selection of the reference on the referring web page, a referred merchant's web page is presented to the end user. Consequently, the end user begins interacting with the referred merchant's web site.

Support for such linking from a referring web site to the referred merchant's web

20 site requires the appropriate code (e.g., the underlying code of a hyperlink to the referred merchant's web site) to be embedded in a web page of the referring web site.

From the foregoing discussion, one can see the importance of error-free generation of the HTML code including the URL underlying commercial and promotional hyperlinks. Thus, there is a need for a web development tool that enables

25 the proper embedding of hyperlinks and reduces errors in the process.

SUMMARY OF THE INVENTION

The present invention is a method and a system for developing and embedding hyperlinks in web pages. The preferred embodiment is a web development tool

employing an application programmer's interface (API). The invention allows web development tools to seamlessly and invisibly connect to a computer system storing promotional hyperlinks to merchants' web pages. A user of a web development tool employing the invention can select a merchant from a list of merchants, select a group
5 of hyperlinks available to the user from the selected merchant, select a hyperlink within the selected group, and place the selected hyperlink on a web page within seconds without having to write or copy any code.

In one embodiment, the invention uses the Hypertext Transfer Protocol (HTTP) to request and receive information stored within the invention system and the eXtensible
10 Markup Language (XML) format to receive information from the system. Further, the invention uses the EncryptServer, a reusable component DLL on the Windows platform, to encrypt and decrypt the messages it sends and receives. The encryption key is identifiable by a key ID sent unencrypted together with requests.

In the preferred embodiment, a computer system and method generates a
15 hyperlink on a web page by a client computer (i) sending a request having an input set of hyperlink parameters, and (ii) receiving a response comprising at least one of:
an output set of hyperlink parameters, and
data necessary for generating at least one hyperlink.

Similarly, a computer method and system of the present invention delivers a
20 hyperlink on hyperlink generation information by a server computer (i) receiving a request having an input set of hyperlink parameters, and (ii) sending a response comprising at least one of:

an output set of hyperlink parameters; and
data necessary for generating at least one hyperlink.

25 The input set of hyperlink parameters may be selected from a plurality of input sets of hyperlink parameters. The input set of hyperlink parameters includes a user name and password (e.g., of the affiliate end user).

The input set of hyperlink parameters and/or the output set of hyperlink parameters includes any combination of at least one of a Merchant identifier, Affiliate

Site identifier, Section Link Group identifier, Link identifier, Image identifier, and Program identifier.

The data necessary for generating the at least one hyperlink comprises code data necessary to execute each said hyperlink. The code data conforms to the Hypertext Markup Language (HTML) standard. The code data may also include a uniform resource locator (URL).

The data necessary for generating the at least one hyperlink comprises visual representation data describing at least one form of visual appearance of said at least one hyperlink on the web page. The visual representation data includes a uniform resource locator (URL) for an image. Further the visual representation data includes indications of dimensions of an image.

Further, the input set of hyperlink parameters may be combined with the output set of hyperlink parameters to form a second input set of hyperlink parameters.

The invention by its ease and simplicity of operation benefits both users of the web development tools employing the invention system and the merchants whose web pages and sites are being promoted by the hyperlinks placed on web pages using the invention API.

BRIEF DESCRIPTION OF THE DRAWING

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of preferred embodiments of the invention, as illustrated in the accompanying drawing. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention.

Fig. 1 is an overview of the invention system and the communications between a client computer and a server computer during deployment of one embodiment.

Fig. 2 is a flowchart of actions performed in the embodiment of Fig. 1.

Fig. 3 is a schematic view of the security configured request messages employed in the embodiment of Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

A description of preferred embodiments of the invention follows.

The word "hyperlink" or "link" used below without additional qualifications refers to both the underlying code and visual representation of a hyperlink created in the process and as a result of practicing the present invention.

The terms "affiliate," "end user," "merchant," "section link group," "vendor," and "web development tool" will be used throughout this specification. An "affiliate" is someone who creates hyperlinks for subsequent inclusion in a web page or web pages. Typically, such web pages are owned by the affiliate. The nature of these hyperlinks and how they are created will be explained below. An "end user" is someone viewing a web page that includes a link or links created by an affiliate. A "merchant" is someone who offers to an affiliate to create a specific hyperlink or hyperlinks to a page or pages on the merchant's web site (i.e., this merchant's hyperlinks). A merchant's hyperlinks are usually grouped into several "section link groups." A merchant usually deals with several affiliates (i.e., this merchant's affiliates). An affiliate may deal with several merchants (i.e., this affiliate's merchants). A "vendor" is someone who develops and supplies a computer application program, called a "web development tool," for use by an affiliate to design web pages. The present invention, when employed by a web development tool, simplifies and makes more reliable the creation of hyperlinks during the design of web pages.

Typically, a hyperlink is intended to bring the end user from a web page on the affiliate's web site to a web page owned by the merchant (normally located on the merchant's web site). In the process of bringing the end user to the hyperlink's destination, some additional information may be transmitted from the end user's computer to a merchant or a third party. This transmission of information is controlled by the code implementing the hyperlink on a web page. The information thus transmitted may be used for accounting purposes, for collecting statistics about the end users' actions on the network, or to facilitate a commercial transaction between the end user and a merchant (e.g., a purchase). Clearly, it is important that the proper code is

used in the hyperlink. Human errors (e.g., a mistake in a single character in the code) are highly probable without automated web development tools.

The present invention allows a vendor's program to automate creation of hyperlinks by accessing a hyperlink database. In the preferred embodiment illustrated in Fig. 1, the hyperlink database 30 stores various preformatted (generally error free) hyperlink code in HTML format and image representations for hyperlinks to respective merchants' web pages. The hyperlink database 30 is combined with a query engine 25 and a search engine 29 to form a database subsystem 31. The query engine 25 enables requests 26 for data from the database 30 to be made. The query engine 25 forms queries from received requests 26. These queries are in a format and configuration acceptable by the search engine 29. The query engine 25 passes the generated queries to search engine 29.

In turn, the search engine 29 responds to the queries received from query engine 25. The search engine 29 processes the received queries (which represent a request 26) and searches the hyperlink database 30 for data that satisfies the queries and hence satisfies the request 26. The search engine 29 extracts or otherwise retrieves data (i.e., preformatted, prepared code for desired hyperlinks, graphical images for visually representing hyperlinks on web pages, etc.) from the database 30 and provides the retrieved data to the query engine 25 as a response to the initial queries from query engine 25. Query engine 25 formats the responses received from the search engine 29 and therefrom provides responses 27 to respective requests 26.

An example of a hyperlink database subsystem is the BFAST system operated by Be Free, Inc. of Marlborough, Massachusetts, (BFAST is a trademark of Be Free, Inc.) Other database subsystems are suitable.

The hyperlink database subsystem 31 is a part of a computer system 21 capable of receiving data requests 26 and transmitting the resulting data (desired hyperlink code and the like) 27 over a network 28. In particular, computer system 21 is coupled for communication across network 28 to a the vendor's web development tool 24 running

on a client computer **20**. During the design of a web page **23**, the web development tool **24** invokes an application program interface (API) **22** to generate the data requests **26** and to receive the resulting responses **27** (e.g., hyperlink code extracted from database **30**). Thus, the API **22** enables web development tools **24** to interact directly with the
5 hyperlink database subsystem **31** (e.g., BFAST) to create hyperlinks on web pages **23** under design/construction.

In the preferred embodiment, the invention API **22** benefits affiliates and vendors by allowing seamless integration of link creation into web development tools **24**. For example Netopia (of Alameda, California), a vendor, can use the invention API
10 **22** with its netJane program to connect to the BFAST database subsystem **31** on behalf of an affiliate. This allows affiliates to get their merchants' hyperlinks (i.e., underlying code especially) and insert these hyperlinks directly into the web pages **23** they are developing using netJane's integrated interface.

The invention API **22** also benefits merchants by offering an easier and more
15 accurate alternative for their affiliates to create the desired links on subject web pages **23**.

Vendors can use the invention API **22** as part of their web development tools **24** to provide affiliates with the ability to do the following:

- 20 enter a user name and password to be recognized by the hyperlink database **30**;
- view a list of their merchants;
- choose a specific merchant to see a list of section link groups available from this merchant;
- choose a specific section link group to see a list of hyperlinks available
25 within this section link group; and
- choose a specific hyperlink and include it in a subject web page **23**.

For security measures, in one embodiment, a user name and a password of the affiliate are required to use the hyperlink database 30. In that case the invention API 22 uses a data encryption scheme to include affiliate user name and password in the requests 26 and to protect the affiliate's (or web development tool's 24)

5 communications. In particular, the portion 37 of requests 26 containing the affiliate user name and password (collectively affiliate ID 35) are encrypted as illustrated in Fig. 3. Each vendor is assigned an encryption key which is stored in server computer system 21 (e.g., accessible to database subsystem 31). The vendor is also assigned a vendor ID 39 (Fig. 3) which is sent unencrypted in request 26. Computer system 21 in receipt of a
10 request 26 uses the unencrypted vendor ID 39 in the request 26 to locate the key assigned to the respective vendor and to decrypt encrypted portion 37 of received request 26. In particular, computer system 21 utilizes the respective vendor encryption key to decode the encrypted portion 37 into the affiliate ID 35 and data request portion of received request 26.

15 Preferably, the invention API 22 uses the EncryptServer, a reusable component DLL on the Microsoft Windows platform, to encrypt the messages (requests 26 and responses 27) it sends and receives.

In the decrypted state the requests 26 received by the hyperlink database subsystem 31 are character strings containing: (i) the version number of the invention
20 API 22; (ii) a time stamp, identifying the time and date when the request 26 was made; (iii) the user name and password of the affiliate; and (iv) information describing what data are requested.

In the preferred embodiment, the invention API 22 sends all data requests 26 to the hyperlink database subsystem 31 through the HTTP protocol using URLs as "data
25 containers." The hyperlink database subsystem 31 parses the URL sent via HTTP, locates the vendor's encryption key (via the unencrypted vendor ID 39 discussed above), decrypts the data request string 37 (including affiliate ID 35), and performs the appropriate actions.

This is an example of the URL sent via HTTP by the invention API 22 in one embodiment:

http://www.reporting.net/networks/affiliates/xml_gen?vendor=1111111?data=FD36SHJDSE853DJ

- 5 The vendor parameter (in the example: "1111111") identifies the vendor partner so the encryption key can be located. The data parameter (in the example: "FD36SHJDSE853DJ") contains the encrypted data request string 37.

Further, in the preferred embodiment, the invention API 22 provides four types of data requests 26: merchant list request, section link group request, section link list
10 request, and hyperlink data request.

With regard to "merchant list requests", the encrypted data request string 37 includes the following parameters:

- 15 "Version," identifying the invention API 22 version;
"Timestamp," identifying the time and date when the request was made;
"Username," identifying the affiliate's user name;
"Password," providing the affiliate's password; and
"Merchant List," identifying the type of data request 26.

When the data request string 37 of the merchant list request type is decoded, the hyperlink database subsystem 31 verifies the affiliate user name and a password and
20 returns (in a response 27) a list of merchants for the affiliate. Preferably the return list of merchants is in the XML data format. This return list includes:

- 25 merchant name;
merchant ID;
merchant logo image URLs (thumbnail and banner graphics); and
affiliate site ID.

With regard to the "section link group request" type, the encrypted data request string 37 includes the following parameters:

- "Version," identifying the invention API 22 version;

“Timestamp,” identifying the time and date when the request was made;

“Username,” identifying the affiliate’s user name;

“Password,” providing the affiliate’s password;

“Section Link Group List,” identifying the type of data request **26**;

5 “Merchant ID,” identifying the affiliate-selected merchant; and

“Affiliate Site ID,” identifying the affiliate site associated with the selected merchant.

When the data request string **37** of the section link group request type is decoded, the hyperlink database subsystem **31** verifies the affiliate user name and a
10 password and returns (in response **27**) a list of section link groups, preferably in the XML data format, for the given combination of Merchant ID and Affiliate Site ID. This return list includes:

section link group ID; and

section link group name.

15 With regard to the "section link list request" type, the encrypted data request string **37** includes the following parameters:

“Version,” identifying the invention API **22** version;

“Timestamp,” identifying the time and date when the request was made;

“Username,” identifying the affiliate’s user name;

20 “Password,” providing the affiliate’s password;

“Section Link List,” identifying the type of data request **26**;

“Merchant ID,” identifying the affiliate-selected merchant;

“Affiliate Site ID,” identifying the affiliate site associated with the selected merchant; and

25 “Section Link Group ID,” identifying the affiliate-selected section link group.

When this type of data request string **37** is decoded, the hyperlink database subsystem **31** verifies the user name and a password and returns (in response **27**) a list of hyperlinks, in the XML data format, for the given combination of Merchant ID, Affiliate Site ID, and Section Link Group ID. This return list includes:

- 5 the name of the specified section link group;
- the list of links in the specified section link group;
- link names;
- link types (e.g. text, image)
- link image URL; and
- 10 image dimensions.

If the Section Link Group ID parameter contains no data, the hyperlink database subsystem **31** returns all links for the given combination of Merchant ID and Affiliate Site ID.

- With regard to the "hyperlink data request" type, the encrypted data request
- 15 string **37** includes the following parameters:
- "Version," identifying the invention API **22** version;
 - "Timestamp," identifying the time and date when the request was made;
 - "Username," identifying the affiliate's user name;
 - "Password," providing the affiliate's password;
 - 20 "Hyperlink Data," identifying the type of data request **26**;
 - "Merchant ID," identifying the affiliate-selected merchant;
 - "Affiliate Site ID," identifying the affiliate site associated with the selected merchant;
 - "Link ID," identifying the affiliate-selected link (e.g., link name); and
 - 25 "Image ID," identifying the graphic image associated with the affiliate-selected link (e.g., link image URL).

When this type of data request string **37** is decoded, the hyperlink database subsystem **31** verifies the user name and a password, and returns in XML format (in response **27**) the HTML code for the hyperlinks meeting the given combination of

Merchant ID, Affiliate Site ID, Link ID, and Image ID. If Image ID contains no data, the hyperlink database subsystem 31 returns the HTML code for a hyperlink which is represented to the end user as text.

In the preferred embodiment, affiliates/users using the web development tool 24
5 employing the invention API 22 do not see the underlying code for the subject desired hyperlinks. They simply drag and drop a completed hyperlink from the vendor's web development tool's interface onto their web pages 23.

Using the above-described data request types of the preferred embodiment, a
typical sequence of data requests 26 and responses 27 combined with intermediate user
10 actions is shown as a flowchart in Fig. 2. In step 50, the web development tool 24 invokes API invention 22 and generates a request 26 for a merchant list from hyperlink database 30. Following HTTP protocol, the API 22 transmits the generated request 26 to hyperlink database subsystem 31. In response, hyperlink database subsystem 31
15 processes the received merchant list request 26 and supplies a list of merchants based on the affiliate identified in the request 26. Hyperlink database subsystem 31 provides the merchant list in XML format in a response 27 which is communicated over network 28 following HTTP protocol to web development tool 24. In step 52 of Fig. 2, the web development tool 24 receives the merchant list from the database 30 and displays the same to the user (i.e., web developer).

20 In step 54, the web developer selects a merchant from the displayed merchant list. In response, the web development tool 24 employing API 22 generates a request for the merchant's link group list. That is, in step 56 the API 22 generates a request 26 of the "section link group request" type and transmits the request 26 to the hyperlink database subsystem 31. In response, hyperlink database subsystem 31 decodes the data
25 request string 37 corresponding to the section link group request 26 and determines the affiliate selected merchant (from the merchant ID parameter) and the affiliate site associated with the selected merchant (from the affiliate site ID parameter). Based on the determined affiliate selected merchant and associated affiliate site, the hyperlink

database subsystem **31** extracts the appropriate section link groups of the merchant from hyperlink database **30** and forms a return list of the merchant's section link groups.

Hyperlink database subsystem **31** transmits the return list in XML format in a response **27** via network **28** to the web development tool **24** (through API **22**). As
5 illustrated in step 58, the web development tool **24** receives the merchant's link group list as extracted from database **30** and displays the received list to the user (web developer).

Continuing with step 60 the web developer selects a link group from the displayed list of merchant's section link groups. In response to this selection, at step 62
10 web development tool **24** employs API **22** to generate a request **26** for the link list of the selected link group. In particular API **22** generates and transmits a request **26** of the "section link list request" type.

Upon receipt of this request **26**, hyperlink database subsystem **31** determines the affiliate selected merchant (from the merchant ID parameter), the affiliate site associated
15 with the select merchant (from the affiliate site ID parameter) and the affiliate selected section link group (from the section link group ID parameter) upon the decoding of the respective data request string **37** of the received request **26**. Based on the determined affiliate-selected merchant, associated affiliate site and affiliate selected section link group, hyperlink database subsystem **31** extracts the names of pertinent hyperlinks from
20 database **30**. Hyperlink database subsystem **31** places the extracted hyperlink names in a return list in XML format and transmits the return list in a response **27** to API **22**/web development tool **24**.

With reference to step 64, the web development tool **24** receives the requested link list from response **27** returned by hyperlink database subsystem **31**. In turn, web
25 development tool **24** displays the received list of hyperlink names such that the web developer may select a desired link from the displayed list at step 66. With this selection, at step 68 the web development tool **24** employs API **22** and generates a

"hyperlink data request" **26**. API **22** transmits the generated hyperlink data request **26** to hyperlink database subsystem **31**.

In response, hyperlink database subsystem **31** decodes the corresponding data request string **37** of the hyperlink data request **26** and determines the affiliate selected
5 merchant, associated affiliate site, affiliate selected link name and optionally the affiliate selected link image URL. With this combination of parameter values, the hyperlink database subsystem **31** searches and retrieves from database **30** the desired hyperlink data. That is, hyperlink database subsystem **31** returns in an XML formatted response
10 **27** the HTML code for the hyperlinks in database **30** meeting the combination of affiliate selected merchant, associated affiliate site, affiliate selected link name and link image URL from the request **26**.

Web development tool **24**, through API **22**, receives the links data in response **27** at step 70. The web development tool **24** displays the received link data to the web developer. In step 72 the web developer uses a drag and drop interaction with the
15 displayed links data to include the links data in the desired web page **23** under construction by the web developer. Where the responses **27** are in the XML data format, the web developer is able to interact with the displayed responses using a graphical user interface drag and drop operation to effect the embedding of the HTML code for the desired hyperlink into the subject web page **23** without the end user (web
20 developer) actually seeing the underlying hyperlink code. Providing and placing desired hyperlinks in a subject web page **23** in this manner automates the process for developing hyperlinks in web pages and reduces error in the process as heretofore unachieved by the prior art.

While this invention has been particularly shown and described with references
25 to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the invention encompassed by the appended claims.

For example, computer system **21** is depicted as a single server in Fig. 1 for simplicity and clarity in illustrating the present invention. It is understood that multiple computers or a network of computers may form computer system **21**. Similarly, only one hyperlink database **30** is depicted in Fig. 1 but may physically be implemented by a plurality of data stores with the same overall functionality as described above.

Further it is understood that various other parameters may be employed in the data request string **37** in addition to or in place of those discussed above in the preferred embodiment. For example, the parameter Program Name or Program ID that indicates the network of the affiliate may be employed.